CLAIMS

1 A lead terminal for electrically connecting a first connected body and a second connected body,

the lead terminal being a plate material consisting of conductive metal,

the lead terminal including;

a welding portion in which electricity is caused to flow in the state caused to be in contact with an external terminal of the first connected body so that the welding portion is resistance-welded to the external terminal of the first connected body;

a connecting portion connected to an external terminal of the second connected body; and

a conductive portion positioned between the welding portion and the connecting portion, and serving to allow these portions to electrically conduct,

wherein the welding portion is formed so that its thickness is thinner than thickness of the conductive portion.

2 The lead terminal as set forth in claim 1,

wherein plural welding portions are provided as the welding portion.

3 The lead terminal as set forth in claim 1,

wherein the welding portion is a recessed portion provided at positions opposite to each other of both principal surfaces of the plate material, or a predetermined position of one principal surface of the plate material.

4 The lead terminal as set forth in claim 1,

wherein in the case where plural welding spots (points) of the welding portion and the external terminal of the first connected body are provided, a slit or slits is or are formed between these welding spots.

5 The lead terminal as set forth in claim 1,

wherein the connecting portion is formed so that its thickness is thinner than the thickness of the conductive portion.

6 The lead terminal as set forth in claim 1,

wherein the conductive metal contains any one kind or plural kinds of nickel, nickel alloy, iron, iron alloy, stainless steel, zinc, zinc alloy, copper, copper alloy, silver, silver alloy, gold, gold alloy, platinum, platinum alloy, aluminum, aluminum alloy, molybdenum, molybdenum alloy, tungsten, tungsten alloy, titanium, titanium alloy, chromium, chromium alloy, zirconium, zirconium alloy, beryllium,, beryllium alloy, rhodium, and rhodium alloy.

7 The lead terminal as set forth in claim 1,

wherein the conductive portion is formed by a laminated body in which plural layers of a first conductive metal having a first conductivity and plural layers of a second conductive metal having a second conductivity are laminated.

8 The lead terminal as set forth in claim 7,

wherein the welding portion consists of the first conductivity metal having the first conductivity lower than the second conductivity.

9 The lead terminal as set forth in claim 7,

wherein the first conductivity metal contains any one kind or plural kinds of nickel, nickel alloy, iron, iron alloy, stainless steel, zinc, and zinc alloy, and

the second conductivity metal contains any one kind or plural kinds of copper, copper alloy, silver, silver alloy, gold, gold alloy, platinum, platinum alloy, aluminum, aluminum alloy, tungsten, tungsten alloy, beryllium, beryllium alloy, rhodium, and rhodium alloy.

10 The lead terminal as set forth in claim 7,

wherein the laminated body is a clad material in which the first conductivity metal and the second conductivity metal are pressurized while heating these metals in the state where they are laminated to thereby laminate and connect the first conductivity metal and the second conductivity metal.

11 The lead terminal as set forth in claim 7,

wherein the laminated body is a laminated wood (plywood) in which the first conductivity metal and the second conductivity metal are pressurized while heating these metals in the state where they are laminated through conductive adhesive agent or film-shaped low melting point conductive metal therebetween so that the first conductive metal and the second conductive metal are laminated and connected.

12 The lead terminal as set forth in claim 7,

wherein the laminated body is a laminated wood (plywood) in which the

first conductive metal and the second conductive metal are welded to each other in the state where they are laminated to thereby laminate and connect the first conductivity metal and the second conductivity metal.

13 The lead terminal as set forth in claim 1,

wherein the lead terminal is provided over a range from one edge end of the conductive portion toward opposite other edge end, and is bendable at a bending portion formed so that its thickness is thinner than thickness of the conductive portion.

14 The lead terminal as set forth in claim 1,

wherein the first connected body is a battery, and the welding portion is welded to the external terminal of the battery.

15 A power supply apparatus comprising a battery, a circuit wiring board for controlling charge and/or discharge operation of the battery, and a lead terminal or terminals for electrically connecting the battery and the circuit wiring board,

the lead terminal being a plate material consisting of conductive metal, and including a welding portion in which electricity is caused to flow in the state caused to be in contact with an external terminal of the battery so that the welding portion is resistance-welded to the external terminal of the battery, a connecting portion connected to an external terminal of the circuit wiring board, and a conductive portion positioned between the welding portion and the connecting portion and serving to allow these portions to electrically conduct,

wherein the welding portion is formed so that its thickness is thinner than thickness of the conductive portion.

16 The power supply apparatus as set forth in claim 15,

wherein the lead terminal is adapted so that plural welding portions are provided as the welding portion.

17 The power supply apparatus as set forth in claim 15,

wherein the lead terminal is adapted so that in the case where plural welding spots (points) between the welding portion and the external terminal of the battery are provided, a slit or slits is or are formed between these welding spots.

18 The power supply apparatus as set forth in claim 15,

wherein the lead terminal is a recessed portion provided at positions opposite to each other of both principal surfaces of the plate material, or a predetermined position of one principal surface of the plate material.

19 The power supply apparatus as set forth in claim 15,

wherein the lead terminal is formed so that thickness of the connecting portion is thicker than the conductive portion.

20 The power supply apparatus as set forth inn claim 15,

wherein the lead terminal is the conductive metal containing any one kind or plural kinds of nickel, nickel alloy, iron, iron alloy, stainless steel, zinc, zinc alloy, copper, copper allot, silver, silver alloy, gold, gold alloy, platinum, platinum alloy, aluminum, aluminum alloy, molybdenum, molybdenum alloy, tungsten,

tungsten alloy, titanium, titanium alloy, chromium, chromium alloy, zirconium, zirconium alloy, beryllium, beryllium alloy, rhodium, and rhodium alloy.

21 The power supply apparatus as set forth in claim 15,

wherein the lead terminal is adapted so that the conductive portion is formed by a laminated body in which plural layers of a first conductive metal having a first conductivity and plural layers of a second conductive metal having a second conductivity are laminated.

22 The power supply apparatus as set forth in claim 21,

wherein the lead terminal is adapted so that the welding portion consists of first conductive metal having the first conductivity lower than the second conductivity.

23 The power supply apparatus as set forth in claim 21,

wherein the first conductivity metal contains any one kind or plural kinds of nickel, nickel alloy, iron, iron alloy, stainless steel, zinc, and zinc alloy, and

the second conductivity metal contains any one kind or plural kinds of copper, copper alloy, silver, silver alloy, gold, gold alloy, platinum, platinum alloy, aluminum, aluminum alloy, tungsten, tungsten alloy, beryllium, beryllium alloy, rhodium, and rhodium alloy.

24 The power supply apparatus as set forth in claim 21,

wherein the laminated body is a clad body in which the first conductivity metal and the second conductivity metal are pressurized while heating these metals

in the state where they are laminated to thereby laminate and connect the first conductivity metal and the second conductivity metal.

25 The power supply apparatus as set forth in claim 21,

wherein the laminated body is a laminated wood (plywood) in which the first conductivity metal and the second conductivity metal are pressurized while heating these metals in the state where they are laminated through conductive adhesive agent or film-shaped low-melting point conductive metal to thereby laminate and connect the first conductive metal and the second conductive metal.

26 The power supply apparatus as set forth in claim 21,

wherein the laminated body is a laminated wood (plywood) in which the first conductivity metal and the second conductivity metal are welded to each other in the state they are laminated to thereby laminate and connect the first conductive metal and the second conductive metal.

27 The power supply apparatus as set forth inn claim 15,

wherein the lead terminal is provided over a range from one edge end of the conductive portion toward the opposite other edge portion thereof, and is bendable at a bent portion formed so that the thickness thereof is thinner than the thickness of the conductive portion.

28 The power supply apparatus as set forth in claim 15,

wherein the battery is lithium ion secondary battery.